

ABSTRACT OF THE INVENTION

Structures and methods of fabricating portions of integrated circuit devices to reduce agglomeration tendencies of high surface-energy metals used in interconnects and contacts. Early transition metals having relatively low surface energies are chosen to form stable crystalline compounds rich in the high surface-energy metal. Agglomeration control layers containing such alloy compounds facilitate adhesion between the high surface-energy metal and an underlying layer of the integrated circuit device, such as a diffusion barrier layer. These agglomeration control layers may be nitrided to improve robustness at higher temperatures.